

THE LEGAL CONUNDRUMS OF THE METAVERSE

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Abstract

The metaverse has gained momentum after the CEO of the biggest social media organization made a statement that the ‘metaverse’ would be the next big thing after the Internet. Although there is no single, agreed upon definition of the metaverse, the common understanding of the metaverse is that the concept combines IoT, AR, VR, XR, and 3D technologies. The market capital and other economic potential of the metaverse is enormous. The market cap was calculated around USD14.8 trillion as of October 2021 while the economic potential ranged from USD3.75 trillion to USD12.5 trillion. Hence, it is of importance to discuss the legal implications of the metaverse. This article is the first to elaborate the legal conundrums of the metaverse in a proper manner. It includes discussion of general and property law and intellectual property law, and whether the time has come to have “a virtual property law.” It also discusses some other legal issues such as privacy and data protection, contract law, including smart contracts, cybersecurity and cyberattacks, monetary and payment systems laws, and regulation of virtual assets (including securities and commodities laws), tax law, anti-money laundering laws and KYC, and criminal law. From a legal perspective, theoretical views on the three waves of technological disruptions to the authority of the law and the demand for respect for the rule of law suggests that the metaverse falls into the first wave of disruption - it creates a space where the law of the real world may be difficult to apply. Therefore, the metaverse disrupts the “traditional claims” from the legal authority and the demand for respect for the rule of law just because it is the law. However, applying this subset of the real-world laws to the metaverse turns out to be possible, but with limitations. Such limitations arise specifically when it comes to the operation of the law.

Keywords: *metaverse, legal conundrums, virtual world, monetary law, payment system law*

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I. INTRODUCTION

Global economic growth slowed when the COVID-19 pandemic broke out. Before COVID-19, the global economic growth had reached 2.8% where the developing countries grew at 3.7% while advanced economies saw only 1.7% economic growth.¹ During the COVID-19 pandemic outbreak, global growth contracted sharply, by 3.1% in 2020, with most economic sectors experiencing declines in their output per capita, largest since the Long Depression of the 1870s.² Although global economic growth was predicted to bounce back at 5.7% by 2021,³ the damage to the economy had been done, leaving it scarred by the pandemic.⁴ COVID-19 had halted the mobility of the people; cities were locked down, borders among economies were closed, and people went into quarantine or isolation.⁵ The market size of most economic sectors declined sharply.⁶ In the tourism sector for instance, one of the most devastated sector hit by the pandemic, the market value dropped by 70% in 2020 (year-on-year), bringing it back to the size it was three decades ago.⁷ The world economy faced a crisis like no other.⁸

However, the pandemic was not only causing a crisis and scarring the economy. Digitalisation has flourished since the COVID-19 outbreak.⁹ Along

¹ IMF, "World Economic Outlook, Recovery during a Pandemic: Health Concern, Supply Disruptions, and Price Pressures" (Washington, D.C., 2021), <https://www.imf.org/en/Publications/WEO/Issues/2021/10/12/world-economic-outlook-october-2021>.

² World Bank, "COVID-19 to Plunge Global Economy into Worst Recession since World War II: Per Capita Incomes to Shrink in All Regions," 2020, <https://www.worldbank.org/en/news/press-release/2020/06/08/COVID-19-to-plunge-global-economy-into-worst-recession-since-world-war-ii#:~:text=According to World Bank forecasts,shrink by 5.2%25 this year.&text=That would represent the deepest,June 2020 Glob>.

³ IMF, "World Economic Outlook, Recovery during a Pandemic: Health Concern, Supply Disruptions, and Price Pressures."

⁴ To have a better understanding on the scarring effects of the COVID-19 pandemic, see for instance Christopher Huckfeldt, "Understanding the Scarring Effect of Recessions," *American Economic Review* 112, no. 4 (2022): 1273–1310.

⁵ Un-Kon Lee, "Tourism Using Virtual Reality: Media Richness and Information System Successes," *Sustainability* 14, no. 7 (March 28, 2022): 3975, <https://doi.org/10.3390/su14073975>.

⁶ Indonesia for instance, most of its economic sectors declined sharply in 2020, with the most severe sectors being transportation and logistics sector (-15.04%) and accommodation services and food beverages sectors (-10.22%). Only a few sectors experienced inclines with health and social services sectors and ICT sectors scored the highest growth, each at 11.6% and 10.58%. Overall, Indonesian economy contracted by 2.07% in 2020. See BPS, "Ekonomi Indonesia 2020 Turun Sebesar 2,07 Persen (c-to-C)," 2021, <https://www.bps.go.id/pressrelease/2021/02/05/1811/ekonomi-indonesia-2020-turun-sebesar-2-07-persen--c-to-c-.html>.

⁷ Lee, "Tourism Using Virtual Reality: Media Richness and Information System Successes."

⁸ Alessandra Mezzadri, "A Crisis like No Other: Social Reproduction and the Regeneration of Capitalist Life during the COVID-19 Pandemic," *Developing Economics*, 2020.

⁹ Varun Grover and Rajiv Sabherwal, "Making Sense of the Confusing Mix of Digitalisation, Pandemics and Economics," *International Journal of Information Management* 55 (2020): 102234.

with the so-called “a new normal,” using digital technologies and innovations has become a new lifestyle for the public.¹⁰ Working from home has become ubiquitous,¹¹ virtual meetings are very common,¹² online and distance learning increases,¹³ and digital transactions score the highest record of lifetime. To overcome the drop in the tourism sector, government and businesses started to use digital campaign such as Virtual Reality (VR) to attract tourists.¹⁴ In Indonesia, the value of transactions using electronic money increased by 42.06% (year-over-year) during the first quarter of 2022, while the value of transactions using digital banking platforms grew at 34.9% (year-on-year).¹⁵ The overall electronic transactions in 2022 are projected to increase by 18.03% (year-on-year) for electronic money, reaching Rp360 trillion,¹⁶ and by 26.72% (year-on-year) for digital banking, amounting to Rp51,729 trillion.¹⁷

The momentum of digitalisation has continued to build post COVID-19. It has been brought to a new level of development when Mark Zuckerberg, the CEO of the social media behemoth, Facebook, announced in October 2021 that the metaverse is the next big thing,¹⁸ a revolution of the Internet from the current state Web 2.0 to the future state of Web 3.0.¹⁹ The same CEO has

¹⁰ Samer Faraj, Wadih Renno, and Anand Bhardwaj, “Unto the Breach: What the COVID-19 Pandemic Exposes about Digitalisation,” *Information and Organization* 31, no. 1 (2021): 100337.

¹¹ Hyoung-Yong Choi, “Working in the Metaverse: Does Telework in a Metaverse Office Have the Potential to Reduce Population Pressure in Megacities? Evidence from Young Adults in Seoul, South Korea,” *Sustainability* 14, no. 6 (March 19, 2022): 3629, <https://doi.org/10.3390/su14063629>. This study brings the phenomenon of working from home (called “telecommuting”) to the next level. It provides an insight that teleworking in particular in the metaverse can triggered people to move away from staying in the megacity. Perhaps, this can be a tool for the government to locate residents better between cities and suburbs.

¹² Ajay Chawla, “Coronavirus (COVID-19)-’ZOOM’ Application Boon or Bane,” *JRRN*, no. 3606716 (2020), <https://ssrn.com/abstract=3606716>. This study shows participants in daily meetings by an online platform Zoom surged to 200 million people in March 2020 from around 10 million by December 2019. Despite the security issues and cyberattacks surrounding Zoom, the use of the online platform meeting increased by 2000% due to COVID-19 outbreak.

¹³ Andrew Bacher-Hicks, Joshua Goodman, and Christine Mulhern, “Inequality in Household Adaptation to Schooling Shocks: Covid-Induced Online Learning Engagement in Real Time,” *Journal of Public Economics* 193 (2021): 104345.

¹⁴ Lee, “Tourism Using Virtual Reality: Media Richness and Information System Successes.”

¹⁵ BI, “BI 7-Day Reverse Repo Rate Held at 3.5%: Synergy Maintaining Stability and Strengthening Recovery,” 2022, https://www.bi.go.id/en/publikasi/ruang-media/news-release/Pages/sp_2410822.aspx.

¹⁶ Nearly USD25 billion, converted using xe.com on 10 May 2022 (for an illustration purpose).

¹⁷ Over USD3.5 trillion, converted using xe.com on 10 May 2022 (for an illustration purpose).

¹⁸ Sascha Kraus et al., “Facebook and the Creation of the Metaverse: Radical Business Model Innovation or Incremental Transformation?,” *International Journal of Entrepreneurial Behavior & Research*, 2022.

¹⁹ Jooyoung Kim, “Advertising in the Metaverse: Research Agenda,” *Journal of Interactive Advertising* 21, no. 3141–144 (2021).

even changed the name of the Facebook company to Meta²⁰ and committed to allocate as much as USD10 billion toward the development of the metaverse.²¹ In this new virtual world, the metaverse, people can act, interact, and conduct commerce with each other like they do in the real world, using avatars.²² In December 2021, someone paid USD450,000 for virtual land.²³ Next to a public figure Snoop Dogg,²⁴ someone spent as much as USD2.4 million²⁵ for a parcel of land in a metaverse's²⁶ fashion district.²⁷ The world created by the metaverse may be virtual, but the economic transactions are real, and the impact on the real world is also tangible. Hence, the interactions in the metaverse can give rise to rights and obligations among the parties involved. Such rights and obligation can be derived from social, ethical, and/or legal norms, mimicking those of the real world as the residents of the metaverse are in fact real people. As the virtual (online) and the real (offline) worlds collide, in the case of metaverse, law and regulations present a conundrum. These issues include how the law in the real world applies in the metaverse, who promulgates the law unique to the metaverse, who will enforce the law, and who will protect the metaverse society and maintain its order.

This article elaborates on the legal conundrums of the metaverse. For the analysis, this article examines how technological advancement disrupts the authority of law and the demand for respect of the rule of law. Brownsword (2022) suggests that there are three waves of technological disruption to the law.²⁸ The first disrupts the claim made by a national legal authority to

²⁰ Michael Saker and Jordan Frith, "Contiguous Identities: The Virtual Self in the Supposed Metaverse," *First Monday*, 2022.

²¹ Dan Milmo, "Enter the Metaverse: The Digital Future Mark Zuckerberg Is Steering Us Toward," *The Guardian*, accessed February 4, 2022, <https://www.theguardian.com/technology/2021/oct/28/facebook-mark-zuckerberg-meta-metaverse>.

²² Alanah Davis et al., "Avatars, People, and Virtual Worlds: Foundations for Research in Metaverses," *Journal of the Association for Information Systems* 10, no. 2 (2009): 90.

²³ The Sandbox. It is considered as the largest metaverse when dealing with real estates, owning approximately 62% of available metaverse lands. In 2012, the Sandbox was an online video game. It has been transformed into a metaverse in November 2021. See <https://www.sandbox.game/en/>.

²⁴ Carmela Chirinos, "Someone Just Paid \$450,000 to Be Snoop Dogg's Neighbor in the Metaverse. Here's How You Can Live by a Celebrity Too," *Fortune*, accessed February 4, 2022, <https://fortune.com/2022/02/02/how-to-buy-metaverse-real-estate-snoop-dogg-celebrity-neighbor/>.

²⁵ A CEO of Token.com, namely Andrew Kriggel. See <https://nationalpost.com/news/canada/canadian-crypto-investor-snags-virtual-real-estate-plot-for-record-2-4-million>.

²⁶ The Decentraland. It was established as an open-source 3D world in 2015. Differ to the Sandbox, lands in Decentraland were limited and able to be acquired by community members only. See <https://decentraland.org/>.

²⁷ Elizabeth Howcroft, "Virtual Real Estate Plot Sells for Record \$2.4 Million," *Reuters*, 2021, <https://www.reuters.com/markets/currencies/virtual-real-estate-plot-sells-record-24-million-2021-11-23/>.

²⁸ Roger Brownsword, "Law, Authority, and Respect: Three Waves of Technological Disruption," *Journal of Law, Innovation, and Technology* 14, no. 1 (n.d. 2022): 5–40, <https://doi.org/https://doi.org/10.1080/17579961.2022.2047517>.

acknowledge their authority in making decisions and to respect their decisions or decrees as “legally binding.”²⁹ This happens when smart technologies creates “a new space” where traditional laws are difficult to apply. For instance, interactions in cyberspace involves many legal jurisdictions, citizens of many countries, complex and novel conduct, and cross-border payments using virtual currencies or assets.³⁰ The second wave disrupts legal doctrine that the law should be respected just because it is the law. It appears when human conduct no longer needs to be ruled by humans, but sufficiently by technology. The third wave goes even deeper. It attacks our conceptual thinking about the authority and respect for the law. When smart technologies govern all human conduct (of course in certain spaces), our conventional thinking about the authority of the law as we know it, and the demand for respect for the law, becomes obsolete.³¹

This article argues that the metaverse is an example of the first wave. It disrupts the “traditional claims” of legal authorities and the demand for respect for the law. Therefore, the legal and governance aspects of the metaverse becomes a conundrum, challenging to be solved. This article tries to solve these issues by discussing the legal, governance, and ethical issues of the metaverse as a problem occurring in the real world. Although imperfect, this approach can be useful as a first attempt to solving the conundrum.³²

This article is the first to elaborate the legal conundrums of the metaverse in a proper manner. Previous studies of the metaverse have consisted of approaches used to develop the metaverse, technological aspects of the metaverse, governance and ethical aspects, and a few subsets or specific issues of the legal aspects of the metaverse, in particular privacy and data protection. The added value provided by this article will be a comprehensive analysis of legal issues of the metaverse, ranging from property, in particular intellectual property laws, contract law and smart contracts, monetary and payment system laws, regulations of crypto assets, tax law, AML and KYC, and criminal law. To the best of our knowledge, none of the studies in existence discuss monetary and payment systems laws or tax law.

This article is structured as follows. First, the theory and practice of the metaverse are outlined in section II. It forms the basis for identifying the conduct occurring in the metaverse. Based on this conduct, legal and ethical issues are discussed in section III. The first issue includes property law and

²⁹ Brownsword.

³⁰ Christopher J. Cifrino, “No TVirtual Property, Virtual Rights: Why Contract Law, Not Property Law, Must Be the Governing Paradigm in the Law of Virtual Worlds,” *BCL Rev.* 5 (2014): 235.

³¹ Brownsword, “Law, Authority, and Respect: Three Waves of Technological Disruption.”

³² Sang Min Park and Young Gab Kim, “A Metaverse: Taxonomy, Components, Applications, and Open Challenges,” *IEEE Access* 10 (2022): 4209–51, <https://doi.org/10.1109/ACCESS.2021.3140175>.

intellectual property law, and whether the need for “virtual property” law exists, privacy and data protection issues, contract law and smart contracts, monetary and payment systems laws. The other legal issues discussed cover the regulations of virtual assets including securities and commodities laws, tax law, AML and KYC, and criminal law. It finally offers concluding remarks under section IV.

II. THE METAVERSE: THEORY AND PRACTICES

In this section, we discuss the theory of the metaverse and its practices in which unique legal and ethical issues arise. Within this theory, we will outline the concepts, the economics, and the technicalities of the metaverse as well as the currencies and payment systems used in the metaverse. As practiced, the applications of the metaverse are explained as they are the source of the legal relationships among its users. These will serve as the basis for the legal analysis.

II.A. The Concepts of the Metaverse

There is no single, agreed upon concept of the metaverse. The term “metaverse” was first coined by Noel Stephenson back in 1992.³³ It was used by him to describe a utopia to avoid the dystopia in the real life.³⁴ This concept has expanded to cover real activities in the virtual world equipped with Augmented Reality (AR), Virtual Reality (VR), and Extended Reality (XR),³⁵ along with 3D technologies, and the internet of things.³⁶ It is otherwise known as the Web 3.0, the next iteration of the Internet from the current state Web 2.0.³⁷

Etymologically, the term “metaverse” is derived from the words “meta” and “universe.”³⁸ Meta means after, beyond, transforming, or transcending.³⁹ A study from Park & Kim (2022) provides an excellent distillation of the many definitions of the metaverse.⁴⁰ However, the most common concept of

³³ Noel Stephenson, *Snow Crash* (London: Penguin Press, 1992), 23.

³⁴ Ronald Leenes, “Privacy in the Metaverse,” in *IFIP International Summer School on the Future of Identity in the Information Society* (Boston, MA: Springer, 2007), 95–112.

³⁵ et al. Philipp A. Rauschnabel, “What Is XR? Towards a Framework for Augmented and Virtual Reality,” *Computers in Human Behavior* 133 (2022): 107289.

³⁶ et al. Nicol’o Dozio, “A Design Methodology for Affective Virtual Reality,” *Computers in Human Behavior* 133 (2022): 107289.

³⁷ Allan V. Cook et al., “The Spatial Web and Web 3.0: What Business Leaders Should Know about the next Era of Computing,” 2020.

³⁸ Michael Zyda, “Let’s Rename Everything ‘the Metaverse!,’” *Computer Published by the IEEE Computer Society* 55, no. 3 (2022): 124–29, <https://doi.org/10.1109/MC.2021.3130480>.

³⁹ Merriam-Webster Dictionary, available at <https://www.merriam-webster.com/dictionary/meta>.

⁴⁰ Park and Kim, “A Metaverse: Taxonomy, Components, Applications, and Open Challenges.” 4214–4215. Here they provide a wide array definition of the metaverse, compiled from 54 studies.

the metaverse⁴¹ refers to the virtual world where its users use avatars to act/interact and Extended Reality (XR) technology as a medium to connect them through their avatars. The difference between the most current concept of the metaverse and the earlier versions, such as that of Second Life, is that it's the first developed using the social values of generation Z, who see no different between offline and online worlds.⁴²

II.B. The Economics of the Metaverse

In October 2021, the metaverse companies had a total market capitalisation of USD14.8 trillion.⁴³ This consisted of, among others, Roblox with market capitalisation of USD15.5 billion,⁴⁴ the Sandbox with market capitalisation of USD1.93 billion,⁴⁵ and Decentraland with a market capitalisation of USD1.9 billion.⁴⁶ Figure 1 maps the market players of the metaverse.

It is worth noting that although the current state of the metaverse has not yet reached its full potential, it has a huge economic potential. Earlier studies suggest that the metaverse has market opportunity ranging from USD3.75 trillion to USD12.46 trillion.⁴⁷ More or less, it has been boosted by the metaverse enthusiasts lately, in particular those of users of cryptocurrencies and Non-Fungible Tokens (NFTs). As shown in Figure 2 below, the daily sales via metaverse applications globally spiked in May 2022, reaching to USD600 million.

⁴¹ et al. Wen-xi Wang, "A Survey of Metaverse Technology," *Chinese Journal of Engineering* 44, no. 4 (2022): 744–56, <https://doi.org/10.13374/j.issn2095-9389.2022.01.15.003>.

⁴² Park and Kim, "A Metaverse: Taxonomy, Components, Applications, and Open Challenges."

⁴³ See <https://www.statista.com/statistics/1280565/global-market-cap-metaverse-facebook-gaming/>.

⁴⁴ See <https://companiesmarketcap.com/roblox/marketcap/>.

⁴⁵ See <https://coinmarketcap.com/currencies/the-sandbox/>.

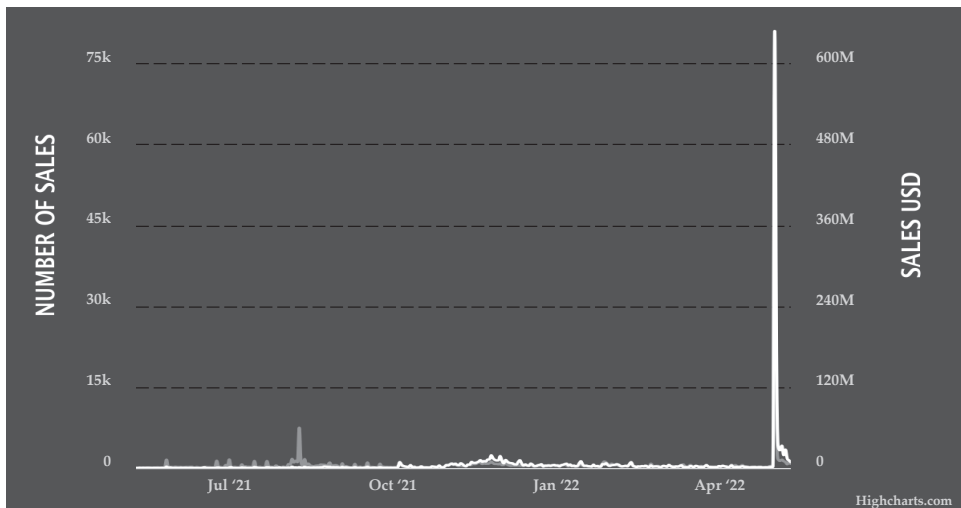
⁴⁶ See <https://coinmarketcap.com/currencies/decentraland/>.

⁴⁷ See for instance a report by Statista, available <https://www.statista.com/statistics/1286718/metaverse-market-opportunity-by-scenario/#:~:text=Metaverse%20potential%20market%20opportunity%20worldwide%202021%2C%20by%20scenario&text=The%20potential%20metaverse%20market%20opportunity,the%20metaverse%20and%20market%20expansion>.

Figure 1. The market map of the metaverse by Radoff
(version 6.1 - updated November 24, 2021)⁴⁸



Figure 2. The daily sales through the metaverse apps for the last one year
(from Market Tracker)⁴⁹



The economic issues of the metaverse include the competition issues between startups and incumbents and the welfare implications from operating the metaverse.⁵⁰ The metaverse is a Keynesian's demand-driven innovation,

⁴⁸ Jon Radoff, "Market Map of the Metaverse," *Medium*, 2021, <https://medium.com/building-the-metaverse/market-map-of-the-metaverse-8ae0cde89696>.

⁴⁹ The data was retrieved from <https://nonfungible.com/market-tracker>.

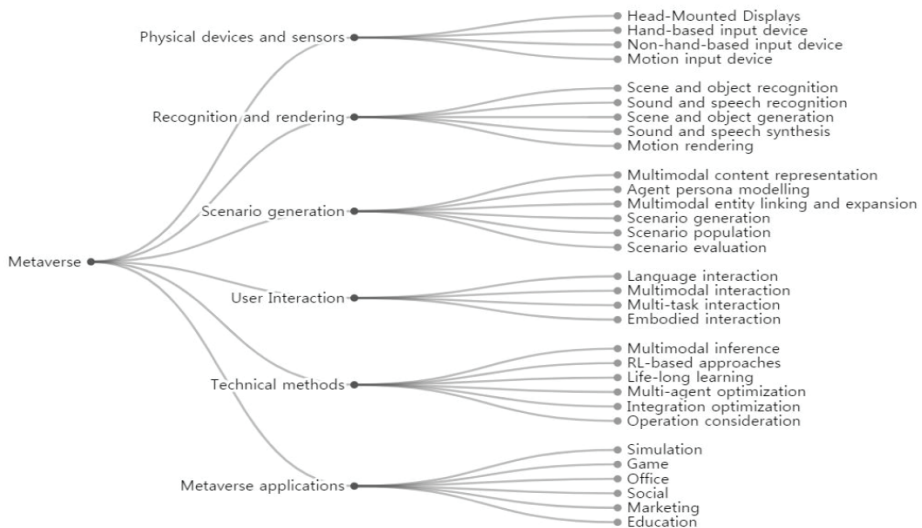
⁵⁰ Paul P. Momtaz, "Some Very Simple Economics of Web3 and the Metaverse," *SSRN*, 2022, <https://doi.org/http://dx.doi.org/10.2139/ssrn.4085937>.

hence “on-demand” products/services embedded in the metaverse will become its strengths.⁵¹ This could lead to it becoming a disruption to business as we know it or remaining a utopia.⁵²

II.C. Taxonomy of the Metaverse

As the metaverse is currently in its early stages, many studies have suggested how to realise the concept of the metaverse better, using different approaches. One which stands out is that of Park and Kim (2022) which provides a taxonomy of the metaverse. They suggest three components and three approaches for realising the concept of the metaverse. Those three components are physical devices and sensors (hardware), recognition and rendering (software), and scenario generations (content). The three approaches consist of user interaction, technical methods for the implementation, and application of the metaverse.⁵³ Details of each component and approach used to make the concept of the metaverse that has come true are shown in Figure 3.

Figure 3. Taxonomy of the metaverse by Park & Kim (2022)⁵⁴



For this study, it is worth noting on the crucial roles of the metaverse applications since they will serve as the basis of legal right and obligation.

⁵¹ Fei-Yue Wang et al., “Metasocieties in Metaverse: Metaeconomics and Metamanagement for Metaenterprises and Metacities,” *IEEE Transactions on Computational Social Systems* 9, no. 1 (2022): 2–7.

⁵² Jeremy Knox, “The Metaverse, or the Serious Business of Tech Frontiers,” *Postdigital Science and Education* 4 (2022): 207–15.

⁵³ Park and Kim, “A Metaverse: Taxonomy, Components, Applications, and Open Challenges.”

⁵⁴ Park and Kim.

These applications consist of simulation, game, office, social, marketing, education,⁵⁵ and economic transactions.⁵⁶

II.D. Currencies and Payment Systems Used in the Metaverse

Activities in the metaverse are tied with the use of cryptocurrencies, NFTs, or tokens as a means of payments.⁵⁷ These virtual assets serve as an economic bridge from the metaverse to the real world. One may say that these assets have indeed given deeper social and economic meanings to the metaverse.⁵⁸ Decentraland for instance, uses Polygon Mana while the Sandbox uses Sand Crypto. Before joining a metaverse, users must provide themselves with digital wallet where they can deposit cryptocurrencies, NFTs, or tokens, such as Mana and Sand.

III. LEGAL CONUNDRUMS OF THE METAVERSE

This section discusses the legal issues surrounding the metaverse; its uses and the parties involved. Drawing from the theory and practices of the metaverse,⁵⁹ we formulated seven types of conduct in the metaverse, including simulation, game, office, social, marketing, education, and economic transactions. All are undertaken virtually. From these types of conduct, we have analysed the relevant legal issues and discuss them in the following subsections.

III.A. Property Law and Intellectual Property Law: The Need for “Virtual Property Law”?

The first and most crucial legal issues relate to whether property law and/or intellectual property law can be applied in the metaverse.⁶⁰ Alternatively, the obvious question arises about whether the time come for “virtual property law.”

General property law deals with right to use things and exclude others from using those things. It answers two common, difficult questions: (i) who has the rights to use those things; and (ii) how they come to have such rights.⁶¹ Common examples of property law would be the uses of land or personal

⁵⁵ Park and Kim.

⁵⁶ Ynag Qiinglin et al., “Fusing Blockchain and AI with Metaverse: A Survey,” *ArXiv Preprint*, 2022.

⁵⁷ Zhou Su Yuntao et al., “A Survey on Metaverse: Fundamentals, Security, and Privacy,” *ArXiv Preprint*, 2022.

⁵⁸ Park and Kim, “A Metaverse: Taxonomy, Components, Applications, and Open Challenges.”

⁵⁹ See elaborations in section II.

⁶⁰ Cory Ondrejka, “Escaping the Gilded Cage: User Created Content and Building the Metaverse,” *NYL Sch. L. Rev.* 49 (2004): 81.

⁶¹ Ben McFarlan, *The Structure of Property Law* (Portland, Oregon: Hart Publishing, 2008).

property such as a bike or a chair. The objective of property law is to provide a just, predictable, and transparent means of allocating among various interests, rights to use things.

In the metaverse, all the objects are virtual, used and stored virtually. They differ from physical objects under the property law in which the latter should be things that can be located physically in a particular place. Although property law systems can be applied to solve problems related to the use of intangible objects, it cannot be used to allocate the use of rights.⁶² Therefore, property law will be less relevant to application in the metaverse.

It is possible that intellectual property is inherently more applicable in the metaverse. Differing from conventional property law, an object in intellectual property law is not necessarily a thing that can be placed physically. Intellectual property law governs the ownerships of intangible objects, and the rights and its derivative forms entitled to the ownerships. These rights include patents, copyrights, and trademarks.

It is important to examine how ownership of intellectual property rights plays a role in the metaverse. In a more traditional manner, ownership in the virtual world can be divided into two distinct types:⁶³

1. Ownership of all property in the virtual world inures to a platform provider. In this case, users will only get a license from a platform provider to use such property. An example for this is the World of Warcraft⁶⁴ where under its Term of Services all rights, title, and interest in and to the platform, without limitation, belongs to the platform provider.⁶⁵ This includes users account, data, computer codes, virtual goods such as currency and digital cards, all characters, and even characters' names.⁶⁶
2. Users are allowed to own some property. A good example for this is Second Life.⁶⁷ Under its Term of Services, users will retain any and all

⁶² McFarlan.

⁶³ Michael Zhou, Mark A.A.M. Leenders, and Ling Mei Cong, "Ownership in the Virtual World and the Implications for Long-Term User Innovation Success," *Technovation* 78 (2018): 56–65.

⁶⁴ The most popular MMORPG (a massively multiplayer online role-playing game) released by Blizzard Entertainment in 2004. According to Statista, World of Warcraft now has around 4.75 million active subscribers. See <https://www.statista.com/statistics/276601/number-of-world-of-warcraft-subscribers-by-quarter/>.

⁶⁵ Activision Blizzard, Inc. (NASDAQ: ATVI), a Santa Monica, California based company, a member of the Fortune 500 and S&P 500. See <https://www.activisionblizzard.com/>.

⁶⁶ See Clause 2 of the Blizzard End User License Agreement, available at <https://www.blizzard.com/en-us/legal/08b946df-660a-40e4-a072-1fbde65173b1/blizzard-end-user-license-agreement> and Blizzard Terms of Use, available at <https://www.blizzard.com/en-us/legal/511dbf9e-2b2d-4047-8243-4c5c65e0ebf1/terms-of-use-for-blizzards-websites>.

⁶⁷ Zhou, Leenders, and Cong, "Ownership in the Virtual World and the Implications for Long-Term User Innovation Success."

applicable to legally cognisable rights including intellectual property right such as copyright.⁶⁸

However, the first kind of ownership structure cannot be applied in the metaverse. Only the second type of the ownership is possible for the metaverse, where the users have rights to own some property. This is because in the metaverse, users' conduct mimics that of the real world, including having rights to own land and/or a house (of course a virtual one), owning currencies to make transactions (and of course cryptocurrencies), or creating, buying, and selling NFTs or tokens.⁶⁹ If the first type of ownership applied in the metaverse, it couldn't not reach its maximum potential. Perhaps, the platform couldn't be called as a the metaverse at all.

If any users in the metaverse are allowed to own some property, the next question will be whether existing intellectual property law suffices to protect the users enjoying their rights of ownership against, for instance, infringements by others. Unlike tangible property law, intellectual property law appears at first blush perfect to do the job. However, limitations arise when it comes to the operation of the law. Issues related to jurisdictions, choice of law, and power of the authority to enforce the law cloud the application of existing intellectual property law, considering that conduct in the metaverse is borderless across jurisdictions and involves individuals from many countries.

III.B. Privacy and Data Protection

Privacy issues arise as the metaverse is considered based on principles of openness and transparency. However, the motives of the people joining the metaverse is always to enjoy social interactions involving sharing of personal data and information with others. As the metaverse is designed for openness and transparency, information sharing is unconditional. In the real world, people hold full control of their own personal information when interacting with others. This is apparently not the case of the metaverse.⁷⁰ Platform providers need to be regulated to prioritise their users' privacy.

The second privacy issue deals with infringement of property right. Like in the real world, people are nosy and curious in the metaverse. During

⁶⁸ See Second Life Terms of Services, Clause 1.2 Paragraph 1: "...you (users) retain whatever legally cognizable right, title and interest that you have in your User Content" and Clause 2.3 Paragraph 1: "You retain any and all Intellectual Property Rights you already hold under applicable law in Content you upload, publish, and submit...". Available at <https://secondlife.com/app/tos/tos.php#:~:text=Eligibility%20to%20Use%20Second%20Life,with%20our%20Skill%20Gaming%20Policy>.

⁶⁹ Zhou, Leenders, and Cong, "Ownership in the Virtual World and the Implications for Long-Term User Innovation Success." In this article Zhou et al. provide a similar analysis but using different terms. They differ the ownerships in the metaverse as: (i) the platform ownership; and (ii) the content ownership. These two ownership frameworks are critical for the metaverse.

⁷⁰ Leenes, "Privacy in the Metaverse," 101-102.

social interactions in the metaverse, they tend to have more engagement with others as “the life” in the metaverse is more fantasy to them.⁷¹ This motive and behavior can put privacy at risk. If a privacy breach occurs, the platform providers have a very limited procedures to mitigate any impacts.

The other issue relates to users’ data protection. The metaverse stores and manages huge swaths data of the users including personal data.⁷² The data traffic is also enormous causing some issues of control. This does not even consider issues related to the cross-border data flows as the users of the metaverse typically come from hundreds of countries.⁷³ Some difficult questions have been put on the table such as: (i) to what extent the metaverse providers are obliged to comply with privacy and data protection laws such as the stringent EU data protection regulations;⁷⁴ and (ii) whether the data protection authorities have power to enforce rules to the providers outside in its their jurisdictions.

III.C. Contract Law and Smart Contracts

Contract law issues in the metaverse are twofold. The first type of contract governs the legal relationship between the platform providers such as Linden Labs or Activision Blizzard and their users. This type of contract appears in the Terms of Services or Uses and the End Users Licensing Agreement provided by platform providers. Unfortunately, there are no minimum provisions within these contracts to protect the users. For example, the difference in court rulings on whether the users can retain their legal rights can complicate things, especially when a dispute arises. No standard treatment would be received by the users across different platforms.

The second contractual relationship governs the interactions among the platform users. As metaverse usage is equally open to any individuals (including businesses), such a contract may be C2C, C2B, or B2B. The outcome in applying a certain law, for instance consumer protection law, may be uncertain, such as when it applies to the real-world cases. The contractual relationships among users are unique and need to be broken down case by case before applying a certain law.

The further issue deal with smart contracts. As the metaverse is essentially a computer program, it develops using computer code, and the use of smart contracts is encouraged.⁷⁵ It promotes practicality, efficiency, and the agility for

⁷¹ Leenes, “Privacy in the Metaverse.”

⁷² Leenes.

⁷³ Second Life for instance has in average of 200,000 users daily coming from 200 countries.

⁷⁴ Leenes, “Privacy in the Metaverse.”

⁷⁵ Zheng Zibin et al., “An Overview on Smart Contracts: Challenges, Advances and Platforms,” *Future Generation Computer Systems* 105 (2020): 475–91.

use in the metaverse.⁷⁶ It will make no sense to apply traditional contracts to every conduct in the metaverse.⁷⁷

III.D. Cyber Security and Cyberattacks

Recently, more and more cyberattacks occur to the virtual world.⁷⁸ The risks to cyber security have increased just as the next generation of the Internet - the metaverse unfolds.⁷⁹ Such risks vary, ranging from identity theft to financial losses caused by a security breach. The key points of security issues of the metaverse encompass: (i) identity management, how providers design and strengthens its security; (ii) DDoS attacks; (iii) device vulnerability, which is more on the user side; and (iv) data explosion and exploitation.⁸⁰ When a breach occurs, the users of the metaverse are the most vulnerable due to limited remedy procedures and jurisdictional/geographical issues.

III.E. Monetary and Payment Systems Laws

The main legal sources of monetary and payment systems law come from two major types of laws: (i) currency law; and (ii) central banking law. The first lays the foundation for the use of currency as a legal tender, while the second gives the central bank the power to adopt monetary policies and to regulate and oversee payment systems within their jurisdictions.⁸¹

Most currency laws define their own currencies as the legal tender. Citizens must use and accept such currency to fulfil financial obligations including satisfying obligations. Some restrict the use of other currencies or assets to perform the obligations, while the others fall in a vacuum in explicitly ruling the use of other currencies or assets. That is why when the use of cryptocurrencies has arisen, and countries have adopted wildly different approaches. Some jurisdictions such as the United States and China have been clear from the beginning to restrict the use of cryptocurrencies within their own jurisdictions. Similarly, Indonesia also bans the use of cryptocurrencies as a means of payment.⁸²

⁷⁶ Loi Luu et al., “Making Smart Contracts Smarter,” in *Proceedings of the 2016 ACM SIGSAC Conference on Computer and Communications Security*, 2016, 254–69.

⁷⁷ Max Raskin, “The Law and Legality of Smart Contracts,” *Geo. L. Tech. Rev.* 1 (2016): 305.

⁷⁸ Shinichi Kamiya et al., “What Is the Impact of Successful Cyberattacks on Target Firms?,” *National Bureau of Economic Research* w24409 (2018).

⁷⁹ Oxford Analytica, “Metaverse Adoption Will Multiply Cybersecurity Risks,” 2022.

⁸⁰ Amaizu Gabriel Chukwunonso et al., “Security in Metaverse: A Closer Look,” in *Proceedings of the Korea Telecommunications Society Conference*, 2022, 199–200.

⁸¹ For central bank law, the IMF maintains a database consisting of central bank laws of most countries in the world, namely the Central Bank Law Database (CBLD) which is open for access by advanced inquiries/registration. See <https://www.imf.org/en/News/Articles/2016/08/15/NA081516-IMF-updates-central-bank-legislation-database>.

⁸² See <https://www.reuters.com/article/us-markets-bitcoin-indonesia-idUSKBN1E11DB>.

Modern central banking laws are more standardised. They mainly consist of the objectives of the central bank and the functions or powers granted by the law for the central banks to achieve such objectives. However, the objectives can be single, dual, or even multiple, depending on the economic, social, and political conditions of the country when establishing its central bank. Whatever it is, the objective of maintaining the price stability, reflected by stable inflation and exchange rates, exist in every central bank law in the world.

As the main objective of the central bank relates to maintaining the price stability, the rise of cryptocurrencies poses a threat to central banks' effectiveness.⁸³ Cryptocurrencies are private money issued and circulated by parties or societies outside the jurisdiction central bank.⁸⁴ The wide use of cryptocurrencies will make the central banks' jobs difficult, especially in controlling the money supply.⁸⁵ Unfortunately, conduct in the metaverse is linked with cryptocurrencies, NFTs, and tokens issued by private party outside the central bank. The rise of the metaverse can pose higher threats to the central bank in performing its duty.

III.F. Regulations of Virtual Assets

Following the issues related to monetary and payment systems laws, it is also crucial to discuss regulations of the virtual assets. Different economies also use different approach in regulating virtual assets.⁸⁶ Regulations applied include securities law that obliges the crypto exchanges to get license from the government, commodities law that treats crypto assets as a commodities,⁸⁷ and anti-money laundering (AML) law and know your customer (KYC) obligations,⁸⁸ which require that virtual assets exchanges fulfill certain obligations such as submitting reports on suspicious transactions.⁸⁹ As the metaverse uses crypto assets only for its transactions, the different application of the laws may complicate its development.

⁸³ Grégory Claeys, Maria Demertzis, and Konstantinos Efstathiou, "Cryptocurrencies and Monetary Policy," *Bruegel Policy Contribution* 10 (2018).

⁸⁴ Orla Ward and Sabrina Rochemont, "Understanding Central Bank Digital Currencies (CBDC)," *Institute and Faculty of Actuaries*, 2019.

⁸⁵ Kee-Youn Kang and Seungduck Lee, "Money, Cryptocurrency, and Monetary Policy," *SSRN*, 2019, <https://doi.org/3303595>.

⁸⁶ Federico Paesano, "Working Paper 28: Regulating Cryptocurrencies: Challenges and Considerations," *Basel Institute on Governance Working Papers*, 2019, 1–11.

⁸⁷ Indonesia is one of the countries treating virtual assets such as cryptocurrencies as commodities. *See* Bappebti Regulation No. 5 (2019) which recognises Bitcoin as a commodity and Regulation No. 7 (2020) which compiles as much as 229 crypto assets as commodities and can be lawfully traded on future exchanges.

⁸⁸ Jurisdictions applying this rule include the US, UK, Canada, and Germany.

⁸⁹ Deloitte, "Regulating Cryptocurrencies," 2018, https://www2.deloitte.com/content/dam/Deloitte/xe/Documents/About-Deloitte/mepovdocuments/mepov25/cryptocurrencies_mepov25.pdf

III.G. Tax Law

Issues regarding taxation of virtual goods and services and conduct in the virtual world have been a prominent concern⁹⁰ among G20 economies' leaders.⁹¹ The question that arose a decade ago has been whether a government can tax transactions in goods, services, and commercial conduct in the virtual world. Frameworks and standards implementing such obligations need to be developed, avoiding double taxations and overburdened. The main backgrounds of this movement are that the virtual world has been seen as a tax haven. Furthermore, the metaverse is linked to the block chained cryptocurrencies for its payments in which such currencies are quite famous for tax evasion.⁹² The volume of economic transactions in the metaverse keep increasing, and the parties continue to enjoy the goods and services in the virtual world, yet it is hard for government to impose taxes. The trillion-of-dollar virtual markets have been untouchable by taxing authorities.

III.H. Regulation of Gambling

Second Life was losing its reputation and many users when the US government prohibited the gambling function of the game.⁹³ The users of the most popular early version of the metaverse had dropped by nearly a half, and Second Life's popularity started to fade.⁹⁴ Recently, the daily active users of Second life averaged 200,000 coming from around 200 countries and jurisdictions.⁹⁵

Learning from the case of Second Life, the regulation of gambling is clearly relevant to the development of the metaverse. Although the metaverse is claimed to be a fully virtual world where the users interact using avatars, it turns out that law enforcement in the real world imposed by the government can have an impact on its sustainability. Hence, metaverse proponents need to be more cautious in development of the regulations in this area.

⁹⁰ This issue has become one of the main priority agenda in the G20, a cooperation group of 20 leading countries and a region including the US, Canada, European Union, Australia, Germany, French, Italy, Arab Saudi, and Indonesia. This year under the presidency of Indonesia, G20 further discussed on the standard and framework to apply tax obligations to conducts in the virtual world.

⁹¹ Bank Indonesia and Ministry of Finance, "No Title," n.d., <https://www.bi.go.id/en/g20/default.aspx>.

⁹² Roberto Moro-Visconti, "From Physical Reality to the Internet and the Metaverse: A Multilayer Network Valuation," *Journal of Metaverse*, 2, no. 1 (2022): 16-22.

⁹³ David C. Wyld, "A Second Life for Organisations?: Managing in the New, Virtual World," *Management Research Review*, 2010.

⁹⁴ Mark Methenitis, "A Tale of Two Worlds: New US Gambling Laws and the MMORPG," *Gaming Law Review* 11, no. 4 (2007): 436-439.

⁹⁵ This data was announced by Linden Labs when celebrating the 18th anniversary of Second Life on 23 June 2021. See <https://mmos.com/news/second-life-celebrates-18th-birthday-touts-70-million-registered-accounts#:~:text=Second%20Life's%20creators%20also%20took,it%20launched%20in%20June%202003>.

III.I. Criminal Law

In a more scientific manner, the metaverse can be perceived from three different views as suggested by Lau (2011).⁹⁶ The first view deals with the question of whether such a virtual world platform brings new dimensions to criminality already known on the Internet. Meaning, there is a potential danger that the current types of criminality on the Internet increases, but for the development of a completely new type of criminality most likely to be low. The second view regards the virtual worlds as a separate society. In this view, the effects of the criminal behavior can be assessed by criminology. However, there is a crucial issue in applying this perspective because the findings of criminology in the real world tend to be difficult to apply to the unique conditions of the metaverse. The third view sees that the metaverse use can trigger feedback effects to the users in the real world. It believes that the long use of the metaverse can have an adverse impact on the behavior of its users in the real world. However, this view is rather absurd at the moment and therefore needs further research.

One says that the potential criminal activity in the metaverse includes stalking, assault and abusive conduct, child pornography, kidnapping, intellectual property law infringements, and financial frauds such as Ponzi schemes, and various scams.⁹⁷ It is hard to assess such potential criminality using Lau's theory previously described. Are these crimes new, or are they similar but separated from the real-world crimes, so that the criminology can be applied? It seems that applying the latter model is simpler. Hence, law enforcement bodies would be able to perform their duties simply using the well-established procedures. However, bluntly applying this view without open for any other possibility views can be dangerous. The future is unknown, and the development of the metaverse is still at early stage. Therefore, open minded are encourage.

III.J. Other Issues: Governance and Ethics

The virtual world has been viewed for a long time as lacking governance. The metaverse is no exception.⁹⁸ The rules applied to such worlds consist of Term of Uses, and community standard/codes provided by the platform providers. There is no democracy whatsoever. The platform owners play dictators ruling their metaverses. Some cases prove that these owners are often have failed to put "social welfare" as a priority simply because they have their own (business)

⁹⁶ Laue Christian, "Crime Potential of Metaverses," in *Virtual Worlds and Criminality* (Berlin, Heidelberg: Springer, 2011), 19–29.

⁹⁷ Simon Mackenzie, "Criminology towards the Metaverse: Cryptocurrency Scams, Grey Economy and the Technosocial," *The British Journal of Criminology*, (2022), <https://doi.org/10.1093/bjc/azab118>.

⁹⁸ Melissa de Zwart and David Lindsay, "Governance and Global Metaverse," in *Emerging Practices in Cyberculture and Social Networking* (Brill, 2010), 63–82.

interests. Therefore, the calls for standardised global governance of the metaverse have emerged.⁹⁹

On the other hand, ethical issues in the metaverse are not less complex than those of governance. They have been put on the table since the use of Web 2.0 and then expanded by the ubiquitous uses of the IoT. There are at least five scenarios relating to ethical issues in the metaverse. These include problem with identity, different ethics and values belonged to different users or groups of users, risk of exploitation, harassment, and vandalism, and even crimes.¹⁰⁰

Although one may raise a question as to whether the ethical issues in the metaverse matter,¹⁰¹ these issues must be solved should the metaverse wish to flourish. For instance, issues related to identity derive from the motives of the metaverse users. Nearly 43% of users join the metaverse to help themselves by learning about their true selves.¹⁰² Once there was even a survey showing that 75% of male avatars were actually women and 80% of female avatars turned out to be men.¹⁰³ Although mimicking activities in the real world, it turns out that avatars in the metaverse are not a 100% representative of the individuals in the real world. Of course, this condition can complicate things in particular when comes to legal rights and obligations.

IV. CONCLUDING REMARKS

The rise of the virtual world, the metaverse, seems inevitable. Many support the development of the metaverse, considering that it offers huge potential. They believe the metaverse will be the next big thing after the Internet, called Web 3.0. However, many others are less optimistic for two main reasons: (i) the idea of the metaverse is not entirely new; and (ii) the early versions of it such as Second Life have not been very successful, while the more current versions such as the Sandbox and Decentraland are still developing. These opponents view the rise of the metaverse is merely hype.

From a legal perspective, the metaverse has created conundrums. Theoretical views on the three waves of technological disruption to the authority of the law and the demand for respect for the law suggest that the metaverse falls into

⁹⁹ Carlos Bermejo Fernandez and Pan Hui, "Life, the Metaverse and Everything: An Overview of Privacy, Ethics, and Governance in Metaverse," *ArXiv Preprint*, 2022.

¹⁰⁰ Hope R. Botterbusch and R.S. Talab, "Copyright and You: Ethical Issues in Second Life," *TechTrends* 53, no. 1 (2009): 9–12, <https://doi.org/10.1007/s11528-009-0227-4>.

¹⁰¹ Carol J. Delaney and B. Guzzetti, "Ethical Issues in Second Life: Do They Matter?," in *Ethical Issues in Literacy Research*, 2013, 119–28, <https://doi.org/10.4324/9780203113509>.

¹⁰² John Urpeth, *Sex, Lies and Reality* (London: Proximity, 2008).

¹⁰³ Botterbusch and Talab, "Copyright and You: Ethical Issues in Second Life."

the first wave. It has created a space where the law in the real world may be hard to be applied. Hence, the metaverse disrupts “traditional claims” from the legal authority and the demand for respect for the law just because it is the law. However, applying real-world law to the metaverse conducts is the simplest way, although it is not without challenges. The conduct in the metaverse is claimed to be mimicking those of the real world, however, applying the law from the real world to the virtual world has many limitations.

The first limitation deals with the property in the metaverse and the ownership framework applied therein. Property law is hard to apply since the property in the metaverse is not an object that can be physically located in a place as required by the property law concept. Intellectual property law might prevail, but the issues of legal jurisdictions, choice of laws, and enforcement by legal authority rise. Such a law may be perfect on paper for the metaverse, but the operation will be faulty or incomplete. The further difficulties relate to: (i) data protection issues as the metaverse stores and manages huge amounts of data including personal data of users, also the cross border data flow issues as the users in the metaverse typically come from hundreds of countries; (ii) applying “traditional” contract law to the metaverse as it mainly uses smart contracts for the sake of practicality, efficiency, and agility; (iii) cyber security issues as more and more cyberattacks occur in the virtual world; (iv) collective efforts of governments around to tax virtual goods, services, and commercial conducts; (v) restrictions by the government on gambling activities in the metaverse has adverse impacts on the development of the metaverse; (vi) applying criminal law to the virtual criminality; and (vii) the metaverse has been accused to be lack of governance and democracy and some of its users lack of ethical conducts.

It is worth highlighting the limitations of applying the monetary and payments systems laws to the metaverse in this paragraph. The sources of the monetary and payments system laws are the currency laws and the central banking laws. Both laws tend to restrict the use of cryptocurrencies including that in the metaverse as it causes difficulties for the central bank to achieve its objective maintaining the price stability. Jurisdictions applying this approach are the US, China, and Turkey. Also, regulations of crypto assets differ from one jurisdiction to another which pose an obstacle for the metaverse to flourish. Such regulations include securities law in the US, commodities law in Indonesia, and AML/KYC law applied in the UK, Canada, and Germany.

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